**DEPARTMENT OF TRANSPORTATION**
DIVISION OF ENGINEERING SERVICES
Office of Structural Materials
Quality Assurance and Source Inspection

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Contract #: 04-0120F4
Cty: SF/ALA Rte: 80 PM: 13.2/13.9
File #: 1.28

# WELDING INSPECTION REPORT

**Resident Engineer:** Pursell, Gary
**Address:** 333 Burma Road
**City:** Oakland, CA 94607

**Report No:** WIR-016400
**Date Inspected:** 21-Aug-2010

**Project Name:** SAS Superstructure
**Prime Contractor:** American Bridge/Fluor Enterprises, a JV
**Contractor:** American Bridge/Fluor Enterprises, a JV

**OSM Arrival Time:** 900
**OSM Departure Time:** 1730
**Location:** Job Site

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| **CWI Name:** | See Below | | | **CWI Present:** | ☑ Yes | ☐ No | |
| **Inspected CWI report:** | ☐ Yes | ☑ No | ☐ N/A | **Rod Oven in Use:** | ☑ Yes | ☐ No | ☐ N/A |
| **Electrode to specification:** | ☑ Yes | ☐ No | ☐ N/A | **Weld Procedures Followed:** | ☑ Yes | ☐ No | ☐ N/A |
| **Qualified Welders:** | ☑ Yes | ☐ No | ☐ N/A | **Verified Joint Fit-up:** | ☑ Yes | ☐ No | ☐ N/A |
| **Approved Drawings:** | ☑ Yes | ☐ No | ☐ N/A | **Approved WPS:** | ☑ Yes | ☐ No | ☐ N/A |
| | | | | **Delayed / Cancelled:** | ☐ Yes | ☑ No | ☐ N/A |

**Bridge No:** 34-0006
**Component:** Orthotropic Box Girders

**Summary of Items Observed:**

At the start of the shift the Quality Assurance Inspector (QAI) traveled to the project site and observed the following work performed by American Bridge/Fluor Enterprises (AB/F) personnel at the locations noted below:

A). Field Splice E2/E3
B). Field Welding Drip Rails
C). Field Splice E4/E5
D). Field Splice E5/E6

A). Field Splice E2/E3

The QAI observed the welder, James Zhen, perform the Complete Joint Penetration (CJP) welding on the longitudinal field splice identified as WN: 2E-3E-A-LS6. The welding was performed on the "A" face of the weld joint utilizing the Shielded Metal Arc Welding (SMAW) as per the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-1012-3, Rev.0 and the weld inspection was performed by John Pagliero utilizing the WPS as a reference. The QC inspector verified the DC welding parameters and were observed and recorded by the QAI as 128 amps.

The QAI observed the welder, Xiao Jian Wan ID-9677 correcting the excessive root opening of the weld joint utilizing the SMAW process as per the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-1012-3, Rev.0. At the conclusion of completing this task the QAI observed the QC inspector John Pagliero perform the visual inspection of the joint alignment and the dimensional measurement of the root

opening. There were no issues noted by the QC inspector and the welder commence the CJP groove welding on the longitudinal stiffener field splice identified as WN: 2E-3E-A-LS2. The inspection was performed by the QC inspector utilizing the WPS as a reference and verified the DC welding parameters which were observed and recorded as 123 amps by the QAI.
The welding of the longitudinal stiffeners was performed in the vertical (3G) position with the work placed in an approximately vertical plane and the groove approximately vertical. The minimum preheat temperature of 100 degrees Celsius and the interpass temperature of 230 degrees Celsius appeared to comply with the contract documents. The electrodes were stored in electrically heated, thermostatically controlled oven after removal from sealed containers. The exposure limits of the electrodes identified as E9018-H4R and the minimum storage oven temperature of 250 degrees Celsius appeared to be in compliance with the contract documents.

B). Field Welding of the Drip Rails

The QAI observed the field welding of the drip rails on the Orthotropic Box Girder (OBG) identified as lift W3 and W4 located at Panel Points 23 and 24. The Complete Joint Penetration (CJP) groove weld was performed by Rick Clayborn ID-2773 utilizing the Shielded Metal Arc Welding (SMAW) as per the Welding Procedure Specification (WPS) identified as ABF-WPS-D15-1010 Rev.1 and was also utilized by the Quality Control (QC) Inspector James Cunningham as a reference to monitor and verify the Direct Current Electrode Positive (DCEP) welding parameters. The welding was performed in the vertical (3G) position with the work placed in the vertical plane and the horizontal (2G) position with the work in an approximate vertical plane and the groove approximately horizontal. Later in the shift the QAI observed the QC inspector verifying the welding parameters and were noted as 133 amps. The minimum preheat temperature of 20 degrees Celsius and the maximum interpass temperature of 230 degrees Celsius was verified and monitored by the QC inspector. The welding was completed and the QC inspector performed a visual weld inspection which appeared to comply with the contract documents.

C). Field Splice E4/E5

The QAI also performed a random ultrasonic verification test on the Complete Joint Penetration (CJP) edge plate field weld splice identified as WN: 4E-5E-F1. A total area of approximately 10% was ultrasonically tested to verify the weld and testing by QC meet the requirements of the contract documents. The examination was performed in the first and second leg and an ultrasonic test report TL6027, was generated on this date.
The QAI also performed a Magnetic Particle Test (MPT) of the edge plate field weld splice identified as WN: 4E-5E-F1. The weld was tested 10% to verify that the welds and testing by QC meet the requirements of the contract documents. The examination was performed as per the contract documents and a TL-6028 was generated on this date.

D). Field Splice E5/E6

The QAI observed the Ultrasonic Testing (UT) on the "A" face of the side plate field splice identified as WN: 5E-6E-C1and C2. The testing was performed by the QC technician Tom Pasqualone utilizing a G.E./Krautkramer USM 35X and the UT Procedure identified as SE-UT-D1.5-CT-100 Rev.4. The QC technician performed the required longitudinal wave testing for base metal soundness followed by the shear wave technique during the testing for weld soundness which was performed utilizing a .75 x .75 rectangular transducer. The UT was completed on this date.

QA Observation and Verification Summary

The QA inspector observed the QC activities and the welding of the field splices utilizing the WPS as noted above, which appeared to be posted at the weld station. The welding parameters and surface temperatures were verified by the QC inspector and utilizing a Fluke 337 clamp meter for the electrical welding parameters and a Fluke 63 IR Thermometer for verifying the preheat and interpass temperatures. The ESAB consumables utilized for the SMAW process appeared to comply with the AWS Specification and AWS Classification. The QC inspection, testing and welding performed on this shift appeared to be in general compliance with the contract documents. At random intervals, the QAI verified the QC inspection, testing, welding parameters and the surface temperatures utilizing various inspection equipment and gages which included a Fluke 337 Clamp Meter and Tempilstik Temperature indicators.

The digital photographs below illustrate the work observed during this scheduled shift.



**Summary of Conversations:**

There were general conversations with Quality Control Inspector John Pagliero, Steve McConnell and Tom Pasqualone at the start of the shift regarding the location of American Bridge/Fluor welding personnel and inspection/ N.D.E. testing scheduled for this shift.

At 1325, the QAI contacted the assistant Field QC Supervisor, Mike Johnson, regarding the request by the QC inspector, Jesse Cayabyab,to schedule QAI verification on the weld identified as WN: 4E-5E-F1. Mike Johnson was the responsible personnel on this date due to the absence of QC Field Supervisor Leonard Cross. Mr. Johnson confirmed the request and inquired of the QAI to commence the UT and MPT verification of the edge plate field weld splices.

**Comments**

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Mohammad Fatemi (916) 813-3677, who represents the Office of Structural Materials for your project.

# WELDING INSPECTION REPORT

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| **Inspected By:** | Reyes,Danny | Quality Assurance Inspector |
| **Reviewed By:** | Levell,Bill | QA Reviewer |